A REVIEW OF THE GENUS ARPHNUS STÅL WITH A NEW SPECIES FROM MEXICO

(Hemiptera: Lygaeidae)

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The genus *Arphnus* (Cyminae, Cymini) was proposed by Stål (1874) for *Oxycaraenus* [*sic*] *coriacipennis* Stål, 1859, described from San Francisco, California. In 1929 Van Duzee described two additional species: *A. tristis* from Sparks, Nevada, and *A. profectus* from Laguna Mountain, San Diego County, California, and gave a key for the three species. A fourth species, *A. tripunctatus*, which was collected on Isabel Island, Nayarit, Mexico, was described by Van Duzee in 1933.

Arphnus is very closely related to the cosmopolitan genus *Cymus*, and is distinguished solely by its greatly extended tylus or clypeus (Fig. 4). This seems to me to be a weak generic character. and some future reviser of generic concepts in the Cymini may feel justified in placing *Arphnus* Stål as a synonym of *Cymus* Hahn. For the purposes of this paper, however, the present concept provides a convenient unit for discussion.

When Van Duzee described *A. tristis* and *A. profectus*, he wrote, "the . . . two forms should, perhaps, be considered as geographical races . . ." of *A. coriacipennis*. Distinguishing the three species has troubled hemipterists, including myself, since usable characters are practically nonexistent. These two species of Van Duzee's are here considered to be synonymous with Stål's species *A. coriacipennis*. *A. tripunctatus* Van Duzee is distinct, and a new, related species is described from specimens in the U. S. National Museum which were intercepted in quarantine from Mexico, usually on orchids. The following key separates the three species left in the genus.

KEY TO THE SPECIES OF ARPHNUS STÅL

1. Width of eye as seen from above about one-half width of clypeus at apex of jugae (Figs. 1, 3); antennal segment II two-thirds length of segment III; (Mexico, Central America) 2
– Width of eye as seen from above nearly equal to width of clypeus at apex of jugae (Fig. 2); antennal segment II four-fifths length of segment III; (western U. S.) ..... *A. coriacipennis* (Stål)
2. Apex of clypeus, and antennal segment IV, black (Fig. 3); posterior margin of prothorax slightly emarginate before scutellum ..... *A. melanotylus* Ashlock

– Apex of clypeus, and all antennal segments, pale (Fig. 1); posterior margin of prothorax straight.....*A. tripunctatus* Van Duzee

ARPHNUS CORIACIPENNIS (Stål) (Figs. 2, 4)

Oxycaraenus [*sic*] *coriacipennis* Stål, 1859. Kong. Svenska Freg. Eugenies resa omkring jordan, 3: 247.

Arphnus coriacipennis (Stål), 1874. Enum. Hemip., 4: 126.

Arphnus tristis Van Duzee, 1929. Pan-Pacific Ent., 5: 189–190. *(new synonymy).*

Arphnus profectus Van Duzee, 1929. Pan-Pacific Ent., 5: 190. *(new synonymy).*

The wider eyes (Fig. 2) distinguish this species from the other two species in the genus. It has been collected in California, Oregon, Washington, Nevada, Utah, and New Mexico.

On July 2, 1954, I collected what at the time appeared to be two species of this genus at Simpson Spring, Simpson Mountain (near Dugway Proving Ground), Tooele County, Utah. Both were swept from *Juncus balticus*; but one, with a black head, prothorax, and abdomen, was found only on plants growing in the moving water of the spring while the other, a pale form, occurred only on plants growing a few feet away on dry land. Nymphs were abundant in both habitats; those on plants in the spring had black heads and thoraces while those on plants growing on dry soil were entirely pale.

This unusual situation made me curious to see how these specimens fit the characters used by Van Duzee in his key. To help discussion this key is reproduced here.

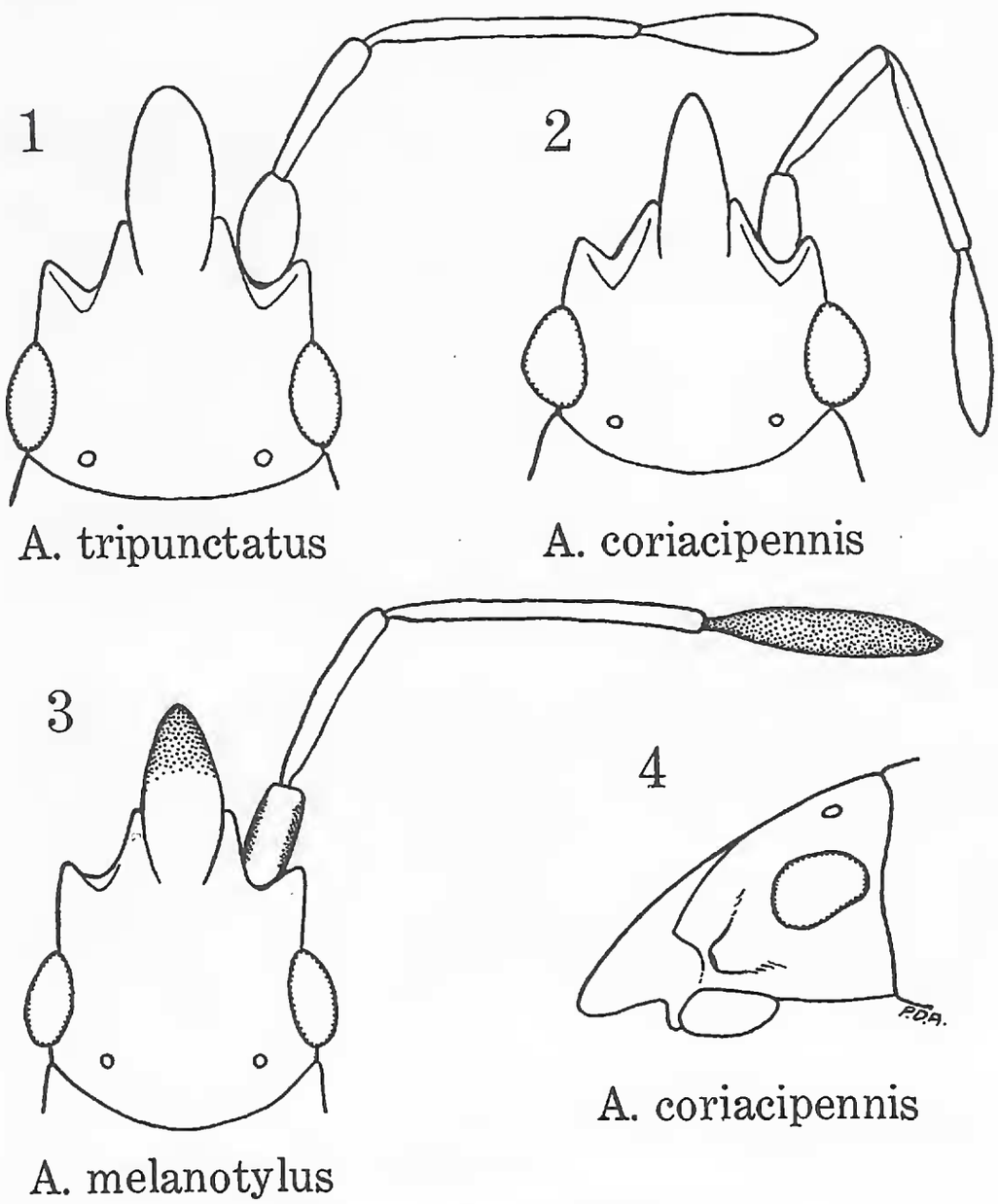
KEY TO WESTERN SPECIES OF APHNUS STÅL
from E. P. Van Duzee, 1929, pp. 188–189

1. Tylus short produced before the bucculae for a distance scarcely more than hlaf the length of the bucculae; head, pronotum and abdomen blackish piceus.....*tristis* n. sp.
– Tylus longer, produced before the bucculae for a distance fully equal to the length of the bucculae; color paler, the head and pronotum sometimes piceus..... 2
2. Tylus attaining middle of antennal segment II; median carina of pronotum obsolete behind the middle; membrane hyaline or faintly smoky; femora usually concolorous.....*coriacipennis* Stål
– Tylus attaining apical third of antennal segment II; membrane with a longitudinal median cloud; color pale, femora piceus.....*profectus* n. sp.

According to Van Duzee's key, dividing the length of the bucculus into the length of the tylus or clypeus should produce a ratio of slightly more than 0.5 for *A. tristis* and of 1.0 for *A. coriacipennis* and *A. profectus*. However, 20 specimens of the

black form from the Simpson Spring series ranged from 0.83 to 1.09 (average: 0.95), while 22 specimens of the pale form from the same locality ranged from 0.83 to 1.25 (average: 1.01). The great overlap present made distinguishing "species" impossible.

Measurements were also taken from the type series of Van Duzee's two western species. For *A. tristis* (7 specimens including the holotype) ratios ranged from 0.75 to 1.09 and averaged 0.89; for *A. profectus* (also 7 specimens including holotype) ratios ranged from 1.08 to 1.36 and averaged 1.21. A series of 8 specimens with dark heads and prothoraces from Inverness, Marin



EXPLANATION OF FIGURES

Figs. 1–3, Dorsal view of head of *Arphnus* species; 1. paratype; 2. Marin Co., California; 3. holotype; Fig. 4, lateral view of head showing clypeus, labium omitted.

County, California (about 25 miles north of San Francisco, type locality of *A. coriacipennis*), had ratios ranging from 0.91 to 1.17, averaging 1.04. A series of 11 specimens of the pale form from Corvallis, Oregon, had ratios ranging from 0.77 to 1.08, averaging 0.91.

Evidently the clypeus-bucculus ratio tends to be clinal, lower in the north and higher in the south. Van Duzee was misled because he compared populations from widely separated localities.

The other characters used in Van Duzee's key break down even more easily. Because most of the variation in the ratios discussed above was caused by variation in the clypeal length, the first part of the second couplet is rendered unworkable. The median carina of the pronotum, mentioned only in the first half of the second couplet, is present in all specimens of the species, but becomes an impunctate line posteriorly; it is very difficult to tell where it ends. The pigmentation of the membrane is very slight in all specimens and takes the form of a longitudinal stripe.

The color differences among various populations are more difficult to explain. Van Duzee's key seems to indicate three different color groups: *A. tristis* with black head and prothorax, *A. coriacipennis* with slightly paler head and prothorax, and the pale *A. profectus*. Actually only the *A. profectus* form is distinct, since the *A. tristis* and *A. coriacipennis* color forms grade completely into one another.

One might be tempted to regard *A. profectus* as a separate species even though there are no morphological characters available to separate it from *A. coriacipennis*. However, the fact that the two forms can live on the same host plant species within a few feet of one another seems to contradict this possibility. It would probably be more logical to assume that the color differences are the result of a physiological response to a single host plant in different environments.

A direct relationship between the color of the insect and the wetness of the host plant's habitat cannot be implied. I have collected the pale form alone at a locality in Utah County, Utah, where the host plant grew in running water, and the darker form in various localities near San Francisco, California (this group includes the ones from Inverness mentioned above), from host plants growing on dry land. Ground water salinity may control

the color of the insect; perhaps some other factor produces the variation.

Since these insects fly readily, the complete separation of color forms encountered at the Simpson Spring locality in Utah is rather strange. The abundance of nymphs found, however, indicates that July 2, the collection date, may have been early in the season for the species. Some valuable observations might be made by someone who found a situation similar to this in a more accessible locality. If the populations become more and more mixed as the summer progresses, and especially if matings could be observed between the darker and the paler forms, then the above proposed explanation for the occurrence of two color forms would be considerably strengthened.

ARPHNUS TRIPUNCTATUS Van Duzee (Fig. 1)

Arphnus tripunctatus Van Duzee, 1933. Proc. California Acad. Sci., (4) 21: 36.

This species and the following are easily distinguished from the more northern *A. coriacipennis* by their narrower eyes. The pale clypeus will immediately separate *A. tripunctatus* from its nearest relative described below. The name *tripunctatus* is apparently derived from the tiny spots at the apices of the clavi and coria. These are found on all three species of the genus.

A. tripunctatus has been reported only from its type locality, an island off Nayarit, Mexico. The U.S. National Museum, however, has specimens collected in 1905 by Frederick Knab from Champerico, Guatemala, and Puntarenas, Costa Rica, all on the Central American mainland.

Arphnus melanotylus Ashlock, new species

(Fig. 3)

Head: length 0.82 mm., width 0.60 mm., interocular space 0.40 mm.; eye, viewed dorsally, half as wide as long, width 0.10 mm., length 0.20 mm., and about half as wide as clypeus at apex of jugae; bucculae 0.22 mm.; antennal segment II two-thirds length of III, subequal to IV, lengths: I, 0.20 mm.; II, 0.37 mm.; III, 0.58 mm.; IV, 0.42 mm.; labium nearly reaching middle coxal cavities, segment I reaching middle of eye, segment lengths: I, 0.40 mm.; II, 0.31 mm.; III, 0.27 mm.; IV, 0.24 mm. *Prothorax:* gradually narrowed anteriorly, slightly wider posteriorly than long, anterior width 0.53 mm., posterior width 0.88 mm., length 0.80 mm.; median carina disappearing in posterior two-thirds; posterior margin slightly emarginate. *Scutellum:* width 0.42 mm., length 0.26 mm., shorter than claval commissure, length 0.53 mm. *Hemelytron:* with corium slightly longer than membrane, corium 1.79 mm., membrane 1.61 mm., basal portion of membrane nearly twice length of apical portion, length from base to level of apices of coria

1.06 mm., length from apices of coria to apex 0.57 mm. *Color:* light brownish-yellow except the following: apex of clypeus beyond jugae, basal segment (except a pale dorsal longitudinal stripe) and terminal segments of antennae, and apices of coria, black; apices of clavi, brown; scutellum slightly darker than hemelytra; legs with basal two-thirds of fore- and middle-femora and basal two-thirds of posterior surface of each hind leg, brown; abdomen ventrally with a brown sublateral stripe from base to segment IV, segment VII pale.

Length, 4.1 mm., width, 1.1 mm. (Range, males: length 3.5–4.4 mm., width, 1.0–1.3 mm.; females: length, 4.1–4.3 mm., width, 1.1–1.3 mm.).

Holotype male. GUERRERO, MEXICO, intercepted at Laredo, Texas, February 28, 1959, on orchid plants (U.S.N.M. Type No. 64855).

Paratypes: Mexico: 1♀, same data as type; 1♂, same data but III-4-1946; 1♂, San Blas, Nayarit, intercepted on orchid at Nogales, Arizona, IV-2-1957 by Noel and Alexander; 1♂, Huichuican, San Luis Potosi, intercepted at Laredo, Texas, XII-21-1951 on *Tillandsia* plants; 1♂, Tamazunchale, San Luis Potosi, intercepted at Laredo, Texas, IV-3-1946; 1♂, Jalapa, Veracruz, intercepted at Laredo, Texas, VIII-13-1945 on orchid plants; 1♂, Fortin, Veracruz, intercepted at Laredo, Texas, XI-6-1952 on orchids; 1♂, 1♀, same date, intercepted II-23-1954; 1♂, same data, but no date; 1♂, Chaverillo (Chavarillo?), Veracruz, intercepted at Laredo, Texas, V-28-1946 on orchid plants; 1♀, Veracruz, II-14-1955 on orchid plants; 1♀, Veracruz, intercepted at Laredo, Texas, X-13-1959 on bromeliads; 2♂, Tuxtla Gutierrez, Chiapas, intercepted at Laredo, Texas on orchid plants, no date; 1♂, same data, III-27-1952; 1♀, Mexico, in pineapple, intercepted at Brownsville, Texas, V-4-1937; 1♀, origin ?, intercepted at Laredo, Texas, I-19-1946 on bromeliads.

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